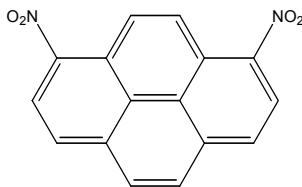


## NITROARENES (SELECTED)

### 1,8-DINITROPYRENE

CAS No. 42397-65-9

First Listed in the *Eighth Report on Carcinogens*



## CARCINOGENICITY

1,8-Dinitropyrene is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of malignant tumor formation in multiple species of experimental animals, at multiple sites and by multiple routes of exposure (reviewed in IARC V.46, 1989). When administered by subcutaneous (s.c.) injections, 1,8-dinitropyrene induced injection-site sarcomas in male mice and male and female rats, and leukemia in female rats (Imaida et al., 1995; Ohgaki et al., 1984, 1985; cited by IARC V.46, 1989; Otofujii et al., 1987; cited by IARC V.46, 1989). Intraperitoneal (i.p.) injections of 1,8-dinitropyrene induced sarcomas of the peritoneal cavity, leukemia, and mammary adenocarcinoma in female rats (Imaida et al., 1991b; 1995). The incidences of mammary tumors, including adenocarcinomas, were increased in female rats receiving 1,8-dinitropyrene by gavage (Imaida et al., 1991b; IARC V.46, 1989).

There are no adequate data available to evaluate the carcinogenicity of 1,8-dinitropyrene in humans.

## ADDITIONAL INFORMATION RELEVANT TO CARCINOGENESIS OR POSSIBLE MECHANISMS OF CARCINOGENESIS

1,8-Dinitropyrene is genotoxic in a wide variety of assays in bacteria and mammalian cells demonstrating evidence of cell transformation activity *in vitro*, and metabolic pathways leading to mutagenic and clastogenic metabolites and DNA adducts have been described (IARC V.46, 1989).

No data are available that would suggest that the mechanisms thought to account for tumor induction of 1,8-dinitropyrene in experimental animals would not also operate in humans.

## PROPERTIES

1,8-Dinitropyrene occurs as light-brown needles (when recrystallized from benzene and methanol) or as a yellow, fluffy, crystalline solid. It has a melting point of  $\geq 300^{\circ}\text{C}$ . When heated to decomposition, 1,8-dinitropyrene emits toxic fumes of nitrogen oxides (NO<sub>x</sub>).

**USE**

1,8-Dinitropyrene has been reported to be a photosensitizer, increasing the spectral activity of bis-azide compounds with light. However, there is no evidence that 1,8-dinitropyrene is currently used commercially for this or other applications. 1,8-Dinitropyrene is available for research purposes at  $\geq 98\%$  purity. It is also available in  $^{14}\text{C}$ - or  $^3\text{H}$ -labeled form at  $\geq 98\%$  radiochemical purity (IARC V.46, 1989).

**PRODUCTION**

One American company produces 1,8-dinitropyrene (SRI, 1992), and Chem Sources identified three American suppliers (Chem Sources, USA, 1992). No data on imports or exports of 1,8-dinitropyrene were available.

**EXPOSURE**

The primary route of potential human exposure to 1,8-dinitropyrene is inhalation. Detectable levels have been found in respirable particulates from ambient atmospheric samples. Higher amounts have been reported in heavy industrialized areas than in nonindustrialized urban and suburban sites. 1,8-Dinitropyrene has been found in various concentrations in extracts of particles from the exhaust of heavy-duty and light-duty diesel engines. It has also been found in small amounts in particulate emissions from kerosene heaters and gas burners. Prior to 1980, some carbon black samples known to be used in photocopy machines were found to contain considerable quantities of 1,8-dinitropyrene (IARC V.46, 1989). 1,8-Dinitropyrene is not listed in the National Occupational Exposure Survey or the National Occupational Hazard Survey conducted by NIOSH.

**REGULATIONS**

OSHA regulates 1,8-dinitropyrene under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-92.